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Class I, HEXAPODA.

Order IV, DIPTERA.

A SYNOPTIC TABLE OF NORTH AMERICAN MOSQUITO LARVÆ.

BY HARRISON G. DYAR, A.M., PH.D.,

WASHINGTON, D. C.

I have had this table in hand for over a year, but have been dissuaded from printing it by Dr. Howard, who advised delay on the ground that new forms were continually being found. Now, however, we have at hand all the larvæ of the known species of the Atlantic Coast region with the exception only of a few rare or doubtful forms, namely *Culex niveitarsis* Coq. and *C. onondagensis* Felt, recently described, *Anopheles nigripes* Staeg., *A. bifurcatus* Linn. and *Culex squamiger* Coq., of doubtful or recently recorded occurrence and *Culex hirsuteron* Theob. and *C. testaceus* Wulp., of doubtful identity.

There are a number of Western species still unknown in the larva, while the West Indies and Mexico as well as the Arctic regions are largely unexplored. Still, as the table seems likely to be useful in its present form for the Eastern United States, it is herewith presented.

1. Mouth hairs in a pair of pencils folded outward and hooked at tip; larvæ predaceous..... 2.
Mouth hairs diffusely tufted, folded inward, not hooked; larvæ not wholly predaceous, feeding on vegetable matter..... 3.
2. Lateral comb of the eighth segment a patch of spines..... *Psorophora ciliata*.
Psorophora howardii.
A lateral plate on the eighth segment..... *Megarhinus portoricensis*.
Megarhinus rutilus.
3. Air tube short, sessile, larvæ floating at surface of water..... 4.
Air tube longer than wide; larvæ floating below surface..... 7.
4. Teeth of comb of equal length..... *Anopheles barberi*.
Teeth of comb of two sizes, long and short..... 5.
5. Teeth of the lateral comb with large branches within..... *Celia albipes*.
Teeth of the comb with fine, obscure pectination only..... 6.
6. Secondary teeth of the comb less than half as long as the primary ones.
Anopheles crucians.
Anopheles maculipennis.
Secondary teeth of the comb over half as long as the primary ones.
Anopheles punctipennis.
Anopheles franciscanus.
7. Air tube linear on its outer half, armed with hooks.... *Teniorhynchus perturbans*.
Air tube conical, fusiform or straight, regularly tapered..... 8.
8. Abdominal hairs short stellate tufts; body pilose..... *Howardina walkeri*.
Hairs of the first two abdominal segments long, the rest short, stellate.
Uranotenia sapphirina.
Uranotenia socialis.
Uranotenia loewii.
Abdominal hairs long, subequal, diminishing gradually posteriorly..... 9.
9. No ventral brush; anal processes two, dilated..... *Wyeomyia smithii*.
Ventral brush present..... 10.
10. Anal processes two; tube short with row of hair tufts; antennal tuft outward.
(*sp. Bahamas*).
Anal processes four or none; not two..... 11.
11. Air tube short, 3×1 or less, or if longer with but a single hair tuft; antennal tuft at the middle of the joint without set-off..... 12.
Air tube long, 4×1 or over, with usually many hair tufts beyond the pecten; antennæ with the terminal portion slender, the tuft usually beyond the middle..... 49.
12. Antennæ bent S-shaped, swollen without, two of the stout terminal hairs removed towards the base..... *Culex discolor*.
Antennæ slightly swollen, narrowed at outer two thirds beyond the tuft, white basally..... *Culex aurifer*.
Antennæ with the tuft at the middle of the uniformly shaped joint..... 13.
13. Seventh abdominal segment with a large dorsal plate..... *Culex signifer*.
Seventh segment without a plate..... 14.
14. Comb of eighth segment of few spines in a single or partly double row..... 15.
Comb of many spines in three or more rows..... 29.

15. Anal segment ringed ; ventral tufts to the base ; tube inflated..... 16.
Without this combination of characters ; tube not inflated..... 19.
16. Antennæ long ; anal segment long and slender 17.
Antennæ moderate ; anal segment short, wider than long..... 18.
17. Comb of the eighth segment of six or seven subequal spines.
Janthinosoma musicum.
Comb of five spines, the upper and lower small.....*Janthinosoma varipes*.
18. Antennæ black on outer half ; the four spines of air tube scattered to basal half.
Grabhamia jamaicensis.
Antennæ all white ; the four spines of air tube restricted to basal third.
Teniorhynchus signipennis.
19. Anal segment not ringed ; usually with slight tufts before the barred area.....20.
Anal segment ringed ; no tufts before the barred area..... 24.
20. Spines of the comb produced, elongate, blunt.....*Culex triseriatus*.
Spines not produced, short, thorn-shaped. 21.
21. Tuft of tube within the pecten ; tube with dorsal tufts*Culex trichurus*.*
Tuft of tube beyond the pecten, no other tufts..... 22.
22. Tuft of tube beyond the outer third ; anal processes pointed.....*Aedes fuscus*.
Tuft of tube before outer third ; anal processes blunt..... 23.
23. Anal plate longer than wide from side view, sharply incised subdorsally.
Culex impiger.
Anal plate wider than long ; no marginal incision.....*Culex sylvestris*.
24. Tube twice as long as wide or more ; comb of nearly simple spines..... 25.
Tube one and a half times as long as wide ; comb of spined teeth..... 28.
25. Comb of four to twelve teeth, large, thorn-shaped..... 26.
Comb a small patch of spines..... 35.
26. Anal processes long ; tube not functional ; larvæ aquatic*Culex dupreei*.
Anal processes normal ; tube functional..... 27.
27. Tuft of tube beyond the middle but within the pecten ; anal processes with apical half constricted.....*Culex serratus*.
Tuft of tube before the middle but beyond the pecten.....*Culex punctor*. †
28. Comb of digitately spined teeth in a small patch..... 36.
Comb of elongate teeth with central longer spine.....*Stegomyia fasciata*.
29. Pecten of the air tube a row of hairs outwardly..... 30.
Pecten of the air tube of toothed spines entirely..... 31.
30. Chitinized parts heavily infuscated, robust ... *Theobaldia incidens*.
Chitinized parts usually weakly infuscated, less robust.
Scales of comb about 60 ; air tube pecten with 1 or 2 teeth.
Culex consobrinus, *Culex magnipennis*.
Scales of comb about 40 ; pecten with 2 or 3 teeth.....*Culex absobrinus*.
31. Anal segment ringed by the plate..... 32.
Anal segment not completely ringed or with dorsal plate only..... 37.
32. Anal processes absent ; pecten of the air tube furcate.....*Deinocerites cancer*.
Anal processes present ; pecten of the air tube serrate..... 33.

* Synonym, *C. cinereoborealis* Felt & Young.† Synonym, *C. abserratus* Felt & Young.

33. Brush of tube beyond the pecten..... 34.
 Brush of tube within the pecten..... *Culex bimaculatus*.
34. Air tube over 2×1 , its pecten of 19-22 teeth..... 35.
 Air tube 2×1 or less, its pecten of 12 to 14 teeth..... 36.
35. Scales of the comb with central apical spine shorter than the body of the scale;
 pecten of air tube of equal teeth..... *Grabhamia sollicitans*.
 Scales of the comb with central spine about as long as the body of the scale;
 pecten of air tube longer outwardly..... *Culex trivittatus*.
36. Spines of comb digitately spined without central one *Culex teniorhynchus*.
 Spines of comb feathered on sides with stout central thorn..... *Culex confirmatus*.
37. Anal processes moderate, not conspicuously tracheate..... 38.
 Anal processes large, swollen, filled with branched tracheæ..... 48.
38. Anal processes moderate, normal..... 39.
 Anal processes short, bud-shaped..... *Grabhamia curriei*.
39. Pecten of the air tube with detached teeth; tracheæ broad..... 40.
 Pecten of the air tube without detached teeth..... 41.
40. Lateral hairs of the first abdominal segments double; detached teeth of comb
 well spaced *Culex absfitchii*.
 Lateral hairs single; teeth only a little detached *Grabhamia vittata*.
41. Air tube long, slender, about 4×1 42.
 Air tube short, stout, 3×1 or less..... 43.
42. Tube scarcely 4×1 ; tracheæ broad, not angled..... *Culex cantans*.
 Tube over 4×1 ; tracheæ narrow, angled..... *Culex fitchii*.
43. Spines of comb thorn-shaped..... 44.
 Spines of comb thick with feathered tips..... *Culex lazarensis*.
44. Anal segment almost completely ringed, tufts to base; tube 2×1 .
Culex astivalis.
 Anal segment distinctly not ringed; tufts scarcely to base; tube 3×1 45.
45. Brush moderate, tufts short-stemmed, chitin mostly brown..... 46.
 Brush large, long stemmed, chitin mostly blackish..... *Culex pullatus*.
46. Head with black lunate spots..... *Culex cantator*.
 Head without such spots..... 47.
47. Comb scales with apical spine longer but not stouter than the subapical ones. .
Culex canadensis.
 Comb scales with apical spine stout and distinct, fringed by the smaller ones.
Culex pretans.
48. Tuft of tube within the pecten; anal processes unspotted..... *Culex atropalpus*.
 Tuft of tube beyond the pecten; anal processes spotted..... *Culex varipalpus*.
49. Antennal tuft at the middle of the joint..... *Culex restrans*.
 Antennal tuft beyond the middle of the joint..... 50.
50. Anal segment with tufts before the barred area..... *Culex dyari*.

* *G. sollicitans* and *C. trivittatus* are very difficult to separate. Compare Smith's figures, Ent. News, xv, pl. ix, 1904, and Bull. N. J. Agr. Exp. Sta., 171, pl. v, 1904. The former figure should be corrected by striking out the little tufts preceding the barred area on the anal segment in Fig. 6.

† Synonym, *C. siphonalis* Grossbeck.

- Anal segment without tufts before the barred area..... 51.
51. Comb of the eighth segment a row of bars..... 52.
 Comb of the eighth segment a patch of spines..... 53.
52. Bars in one single uniform row; body glabrous.....*Melanoconion melanurus*.
 Bars spine-like, in an irregular row; body pilose.....*Melanoconion atratus*.
53. Tube very long, concave, the tip a little wider.....*Culex territans*.
 Tube long, but tapered to tip..... 54.
54. Antennæ net white banded; tube somewhat fusiform.....*Culex pipiens*.
 Antennæ usually conspicuously white banded; tube tapered..... 55.
55. Tube longer, over four times as long as wide..... 56.
 Tube shorter, four times as long as wide, not over.....*Culex tarsalis*.
56. Tufts of the tube scattered, fine, irregular.....*Culex salinarius*.
 Tufts of tube along middle of posterior margin only, rather large...*Culex secutor*.

BRIEF NOTES ON MOSQUITO LARVÆ.

BY HARRISON G. DYAR, A.M., Ph.D.,

WASHINGTON, D. C.

CORRECTION OF THE ACCOUNT OF *CULEX CONSOBRINUS* DESV. — I described this larva from specimens sent by Messrs. Dupree and Morgan (Journ. N. Y. Ent. Soc., xi, 24, 1903), and expressed some doubt both there and at another time (Proc. Ent. Soc. Wash., vi, 39, note, 1904), whether the young larvæ were correctly associated. We have lately received from Dr. Dupree a full set of specimens of all stages, and it shows that the first ones were wrongly associated. There is no such remarkable change as those specimens indicated.

The eggs are laid in curved, boat-shaped masses, as in *pipiens*. The first-stage larvæ have the antennæ longer than the mouth brushes with a single hair at the middle; tube thick, about two and a half times as long as wide, with the outer half weakly infuscated, the pecten of four branched teeth with the usual tuft, composed of one hair, at about the middle of the pecten, very near the base of the tube. Anal segment with a dorsal plate and dorsal tuft of four hairs and one smaller side hair. Lateral comb of the eighth segment of five long, sharp spines. In stage ii the antennæ are as long as the mouth brushes only, with a tuft at the middle; the tuft of the air tube consists of two hairs, situated at the base of the posterior incision of the chitin, the pecten of seven branched teeth and two remote, longer, unbranched ones. The comb of the eighth segment is three rows